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THE TREATMENT OF MINOR SURGICAL INJURIES AND DISEASES.

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The importance of properly treating the various minor injuries and local infections has never been fully appreciated by the average practitioner and practically not at all by the layman.

The lack of due care and proper treatment has been a fertile source, in many instances, for loss of life and limb, besides the personal suffering and financial losses incident to deformity and impaired function of the extremities.

The carelessness of the layman and his reliance upon the efficacy of practices so commonly found among the people is no doubt largely responsible for the fact that the ordinary physician is neither prepared in skill nor means at hand for their care.

The injuries and diseases below enumerated, constitute a very large part of the practice that daily comes to the office of the physician.

In view of these facts and that this class of injuries is in such preponderance when compared to those necessitating the larger operative procedures and considering that they affect the most productive part of the national population, a discussion of the most simple and at the same time

effective treatment of these conditions, appears of paramount importance.

A classification of the most common injuries and diseases follows:

Contusions, abrasions, crushes, sprains, fractures of bones in hands or feet; burns, lacerated, punctured, incised and wounds of skin and other tissues. Surgical diseases, such as abscess, felons, ulcers (varicose and others), carbuncles, boils, furuncles, palmar abscess, and infected wounds.

There are two principles, which intelligently applied, comprise almost the entire treatment of these conditions. They are "Rest and Position." By rest, we are to understand both body rest and rest of the extremity, as a whole, but more important than all, is tissue rest. Tissue **unrest,** as Bernays would have it, is due, first, to infection by the various organisms, and second, by the separation and malposition of bony and other tissues which mechanically prevent union and healing, resulting in deformity and loss of function, when not corrected. Tissue rest, then, can only be obtained by the prevention or removal of infection from wounds, however small or extensive, and thorough reposition of parts malposed, as a result of fracture or other solution of continuity. Tissue rest may be obtained by asepsis, disinfection of wounds, liberation of pus, removal of necrotic tissue and the use of splints and other suitable dressings.

Position is an important adjunct to the above, as rest of the body as a whole prevents an expenditure of force and vitality that can otherwise be employed for repair of tissue.

An infected extremity should be made to assume such position as will favor disengorgement, thus allowing free circulation of arterial blood to the part. As an example, an infected hand or finger will be more comfortable and also heal better when suspended in such a manner that gravitation assists the return flow of blood to the body, than it will in a pendent position which allows engorgement mechanically interfering with circulation in the part, promoting destructive processes, and, to this extent, interfering with repair.

To secure uniformity of results, one must of necessity so systematize his technique that no detail in the preparation of patient or physician will be overlooked; a system or routine continuously followed, shortly becomes a habit and as such, easily followed. Adherence to some recognized system of technique secures for the patient the least chance for infection or the best opportunity for recovery should infection have already occurred.

Every practitioner should include in his armamentarium, the following articles: Green soap, sapo Mollis, U. S. P., a half dozen hand and nail brushes, not too stiff, a large stock bottle of saturated solution boric acid, ethyl alcohol 95%, wood alcohol, bichloride tablets or germicidal discs of mercurie iodide, P. D. & Co., ether, tincture iodine, carbolic acid, glycerine, absorbent cotton, gauze, bandages, zinc oxide, adhesive tape, plaster of paris, loose and in bandages, a few pieces of light wood, out of which suitable splints may be fashioned for different localities, four or five pairs of steel insoles, rights and lefts, assorted sizes and an inner tube of a bicycle tire. The bicycle tube is the best Esmarch I have ever used and is equally ef-

fective as an elastic bandage where bloodless work of the extremities is to be done. It is both cheap and durable, costing $1.25, and serviceable for five or six years. Lastly, a sterilizer which may be commodious, portable and cheap, sterilizing as effectively as the best.

The most of us do not know the value of soap, water and brushes. These are the most useful of all agents in preparing the surgeon's hands, the various operative fields and the cleansing of wounds and adjacent territories, especially so in the preparation of the fields surrounding infected areas.

Contusions, abrasions, lacerations, incised and punctured wounds, are with the exception of a few minor details, treated very much alike. They are oftentimes co-existent. A contusion may be extensive, but the most of them are small, the result of minor degrees of violence. The large ones may need drainage for purposes of removing clots of effused blood. The mechanical removal of clots and large amounts of serous effusion assists in the restoration of the vaso-motor function, a very necessary aid to resolution.

At the very outset, these injuries should be regarded as having infectious agents in or about them. The surgeon must first scrub his hands thoroughly with soap and water, using a scrub-brush; his finger nails should be cut short and kept clean. In scrubbing the fingers and nails of both patient and surgeon, particular attention should be paid to scrubbing in **between** the fingers, and **under, along** and **around** the attachment **of the nails.**

In scrubbing the toes and feet of the patient, this rule should be scrupulously followed.

The entire face of the wound, if infected, must be gently scrubbed with a soft brush and plenty of soap and water, including a large area surrounding it. If the parts are hairy, they may be shaved as hairs are always loaded with bacteria and act as foreign bodies when displaced into the wound. Recent wounds should be subjected to the iodine treatment, in which case scrubbing or washing is not to be employed.

After the soap and water washing, the part may now be scrubbed with 95% alcohol and 1-3000 sol. of bichloride or 1-5000 sol. iodide of mercury. Or mop the wound with tr. iodine and paint the skin for several inches adjacent to it, lightly with the same, applying a sterile dressing.

Lacerations involving the structures below the skin, should now be rinsed with saturated solution boric acid or sterile salt solution and a sterile dressing applied. Lacerations and incised wounds may be closed with or without drainage or left open to granulate as the judgment of the physician may direct, the chief consideration being to deal with the infection at the point of injury. A moderate amount of bloody oozing is not ordinarily objectionable, since fresh blood is the best of germicides, but means must be at hand for its absorption and removal after having performed this very important function. It may be assumed that after the most elaborate process of wound cleansing, there are always left in and about the

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wound greater or less numbers of pathogenic bacteria. Methods must therefore be employed to prevent reinfection from this source, which, at the same time, remove to a greater or less degree, the blood and serum that accumulates at the bottom of the dressing, wthout being compelled to remove the dressing.

Formerly, it was my custom to keep the dressing moist with 1-5000 solution bichloride or with indefinite and varied solutions of boric acid. But, since reading E. H. Oschner's paper, entitled, "The Prevention and Treatment of Septic Infection of the Extremities" (January, 1911), I have adopted his suggestion in reference to saturated solutions of boric acid with 1-6 95% alcohol added. The results have been so satisfactory that I cannot extol it too highly.

The thickness and extent of the dressing should vary with the depth and extent of the wound. A few layers of gauze for a compress covered with a roller bandage in minor contusions and abrasions, is sufficient, but deeper and more extensive wounds should have comparatively thick dressings: 1st, next the wound, a rather fine meshed gauze covered in turn with other layers of gauze which, if it please the surgeon, may be of coarser texture—over this a layer of cotton covered with another layer of gauze and the whole secured by a neat gauze bandage, which may be tied, pinned or fastened with adhesive tape. This should now be thoroughly moistened and kept moist with a solution of alcohol, one part or more as the exigencies of the case may demand, in a saturated solution of boric acid, five or less parts. The reasons for this dressing and solution are as follows:

The fine meshed gauze at the bottom of the dressing prevents to a large extent, the entanglement of reparative granulations, which may be broken down at subsequent dressings, causing pain and discomfort and interfering with repair. The fine meshed gauze, however, does not interfere with the capillarity of the dressing.

The heavier dressing holds its moisture longer and protects and supports the parts, doing away to some extent, with the necessity of frequent change of dressing—a very important consideration. The frequent changing of dressing in the most of these injuries is an evidence of improper and unclean treatment. It also prolongs the period of recovery because of the destruction of granulation tissue and offers opportunity for further infection besides causing unnecessary pain and discomfort to the patient, to him a very important item.

As has been stated by Oschner, saturated solution of boric acid is not a germicide and "does not prevent the growth of pathogenic bacteria, but undoubtedly has great power in reducing their virulence." Alcohol is a powerful dehydrant, with germicidal properties. This solution when used as suggested, gives a sense of warmth and comfort to the patient, preventing the "clammy coldness" so commonly found where wet dressings are employed. A dressing of this kind is active in its capillarity, the volatility of the alcohol contributing largely to this feature. On account of this, there is

a continuous flow from within the tissues to the external surface of the dressings, the alcohol acting as a dehydrant to the tissues, stimulates the blood flow to the wound surfaces, thus supplying the injured tissues with a constant supply of fresh arterial blood, the principal factor in repair, and the current from this point picks up and removes toward the surface of the dressing the used soluble products and the soluble remains of destroyed tissue, both the alcohol and boric acid serving to make them unfertile fields for the propagation of bacteria. It has often been my experience to find these dressings with a superficial appearance of profuse oozing or unwarranted hemorrhage, to find the inner and lower parts of the dressing comparatively free from the gross appearances of blood.

Dressings kept moist wth this or other solutions are more easily removed because they are less likely to stick to the wound and the several layers of the dressing are for the same reason separated from each other with greater ease by the surgeon, inflicting a minimum amount of pain upon the patient.

These dressings will retain their moisture much longer by covering them in with gutta percha-tissue or oiled silk, but the objection to this is that the covering while retaining the moisture, prevents the circulation in the dressings from the point of infection or the bottom of the wound, outward, toward the surface of the dressing, thus inhibiting drainage. Contusions, lacerations, abrasions, and crushes of the feet, hands, fingers and toes are often complicated by fractures of some of the bones, many of which are compound. As these injuries are in a large part received by individuals who are laborers, they are therefore, peculiarly liable to infection, so that the problem of adequately dealing with this feature constitutes the chief end and aim of the attending surgeon. We all fully appreciate the disastrous results that so frequently follow the slightest abrasion of the skin when not properly treated. Lacerations, contused or otherwise, with or without accompanying fracture, when not too extensive, may be immersed or gently bathed in a 2% solution of carbolic acid and sterile water; otherwise, a general anesthetic will be necessary. In making this solution, sufficient glycerine should be mixed with the carbolic acid to render it fully soluble in the water. This solution is mildly antiseptic, but more important, it is anesthetic and thus permits the parts to be thoroughly scrubbed with soap and water, alcohol and ether, preparatory to the final dressing, with comparative comfort to the patient. All loose spiculae of detached bone may now be removed, together with any other foreign bodies that may be present. Attached fragments of bone should be reposed as nearly in their normal position as possible. Bone fragments that project to such an extent that they cannot be so replaced, may be trimmed with the bone forceps, taking care to retain the periosteal membrane as nearly intact as possible. The wound may now be mopped with tincture of iodine, and a wide area of skin surrounding the wound should be well painted also. Or, it may be irrigated with a solution of tincture of iodine, 4 teaspoonfuls to the quart of sterile water or normal salt solution after which

the adjoining skin area should be painted with the pure tincture. The irrigation with iodine solution is often a very valuable procedure in making subsequent dressings and particularly if there has been tuberculous infection. The wound properly cleansed, if fractures are a complication, should receive a copious dressing of sterile gauze and cotton, or the dressing in an emergency may be wrung out of a 1-3000 or 1-5000 solution of Bichloride and a suitable splint applied. The splints in such cases should be so applied that they are apposed to the side of the extremity having the least injury and in such a manner as to perfectly immobilize the part. The splint so applied does not interfere with drainage and the subsequent applications of boric acid and alcohol solution. In this position, also, being as far removed as possible from the immediate field of the injury, its presence occasions less pain and discomfort than if placed directly over the wound.

It sometimes happens that in injuries of hands, fingers, feet and toes, that fractures, though present, may not be detected by the ordinary means of examination; and even though they do not exist, the application of a splint serves well many purposes, in that it promotes rest and security to the part and protects the surgeon in an action for malpractice should it later develop that fracture was indeed present. In all cases of doubt, then, however remote the possibility, use a splint.

In injuries of the feet, we use for splints steel insoles, such as are commonly employed in the treatment of "flat foot." They are first padded with sheet wadding so as to make them conform to the natural contour of the foot and applied with the other part of the dressing. Being of metal, they can be easily and quickly sterilized by boiling when necessary. Most injuries of the feet and toes, are dorsal, which makes the plantar splint very acceptable.

There are two other points to be considered in the treatment of these injuries.

The first has reference to the amount of pain caused by making primary and subsequent dressings; the second, making them neat, comfortable and durable.

Too many of us are inclined to minimize the amount of pain incident to wound treatment. We must remember that it is one of our chief functions to relieve and prevent pain. Pain in a wound after treatment is usually an indication of infection or improper treatment or both, particularly so, if it is severe. Pain, beyond a minor degree, caused by dressing is very often due to gross carelessness resulting from ignorance of the ordinary surgical refinements. Pain contributes to or may alone, be the sole cause of shock. And many individuals, the recipients of injury, both from past personal experience and the prevailing opinion of many of the laity relative to surgical cruelty and pain, are deterred from placing themselves in the hands of men who are in every other particular perfectly competent to successfully treat them. A painstaking surgeon in this respect is of great value to his patrons and to corporations employing him.

Neat, snug, well fitting and comfortable dressings are significant tributes to the competency of the surgeon. To the patient and physician alike, they are the most satisfying because they accomplish more good than if otherwise applied. To the casual observer, they carry the conviction of care and capability on the part of the workman.

A slovenly applied dressing or bandage, especially when made without due regard to the service that may result from its proper employment, at once becomes an efficient advertisement of careless incompetence and negligence..

Such dressings are usually inefficient because of unequal pressure; and as a result of their insecure and unstable character may come down, or by opening up in various places, prepare avenues for the entrance of infectious agents from the exterior.

Bandages on exposed parts should by all means be neat, clean, evenly and symmetrically applied and in such a manner that insures their position until time for their proper removal. This precaution eliminates the necessity for a change of dressing except for legitimate cause.

The exterior of many such dressings becomes so soiled and unsightly that for the sake of appearance alone, a change may be demanded before the dressing proper should be disturbed. Here the outer layers of bandage may be removed and be replaced by sufficient turns for the sake of cleanliness.

After having completed the dressing, we usually moisten it thoroughly with 95% ethyl alcohol 1 part, and a saturated solution of boric acid five parts, giving the patient a prescription for from six to sixteen ounces of this soluton which may vary in the relative proportion of its constituent parts at the surgeon's discretion. This he is directed to pour on the dressing in only such amount and at such intervals of time as will keep the dressing moist without allowing it to get soppy.

The patient is also instructed as to functioning of bowels and kidneys. In the event of paroxysms of pain originating in or about the wound, he is instructed to pour on such quantity of solution as will enable him to feel it soaking into the wound. As a rule, this at once relieves the pain, but if not, he is then to return to the surgeon who can inspect the wound if necessary. Except in unusual cases, we do not remove our dressings sooner than from four to six or ten days; almost all minor injuries being found in a state of good repair by this time.

As an example, may be mentioned the case of a young man, a machinist's apprentice, who suffered an injury to his left great toe by letting a connecting rod fall or roll over on it. The toe was cut almost off from above downward through the base of the last phalanx. The foot and toes were filthy, the source of a foul odor. The distal portion hung loosely downward, being connected to the proximal portion by the thick plantar skin and a small portion of other soft tissue which fortunately was sufficiently vascular for future reparative purposes. The distal end of the proximal portion of bone was splintered and projected upward out of the

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wound and could not be reposed. This was cut away and removed with other detached fragments. The toes were immersed in 2% phenol glycerine and sterile water solution for about five minutes, when they were removed and the entire foot to above the ankle thoroughly scrubbed with soap and sterile water the wound being gently washed and scrubbed likewise. The entire foot including the toes was scrubbed with 1-3000 bichloride solution and mopped with alcohol, after which the skin adjacent to the wound was painted with tincture iodine; the wound itself being mopped out with a dilute solution of the same. No sutures were taken. A sterile dressing was now made to cover the entire foot as far up as the ankle, the toe first being wrapped with a few turns of a gauze strip. A small splint was adjusted as a part of the dressing and the whole carefully bandaged to above the ankle and made secure by a few turns of a one-half inch strip zinc oxide adhesive plaster, after which the dressing was moistened with the alcohol and boric acid solution in the usual manner.

As a matter of precaution, the wound was examined on the evening of the fourth day following the injury, exhibiting no evidences of infection. On the tenth day from date of injury, the wound was practically healed, the line of union being as closely approximated as if it had been sutured. He was discharged on the fourteenth day ready for work. He suffered practically no pain and did not lose a single night's sleep on account of pain, from the date of injury until the day of his discharge.

The therapeutic advantages of drainage in surgical practice are amply exemplified in the results following the above methods of treatment. With no intention to minimize the value of the boric acid solution and alcohol, respecting their germicidal and anodyne properties and their inhibitory action regarding bacterial propagation, it is my firm belief that the very efficient drainage which is so secured, contributes largely to the recovery of these cases. The subject of drainage at once suggests a mental picture of various devices, tubes of glass or rubber, gauze wicks, cigarette drains and gauze packs, that have been and still are extensively used for drainage. These have many times been employed to excellent purpose notwithstanding the fact that they are simply avenues for the escape of accumulations from within a very circumscribed area, which escape is accomplished without the aid of the operation of physical and physiological functions or laws, and without which drainage cannot be but imperfect.

The gauze pack or dressing which we have advised for the minor injuries under discussion, when moistened and kept so by the use of boric acid and alcohol solution, permits of drainage being complete and continuous for as long as the wound remains open. The dehydrant effect of this solution stimulates a continuous flow of blood to the wound surface from the interior, allowing the blood to perform its important reconstructive and germicidal functions, also supplying a vehicle in the form of serous transudation that is utilized mechanically for the transportation of detritus from the wound to the exterior of the dressing.

We have here all the necessary requisites for perfect drainage; con-

tinuous capillarity-volitility of the fluid drain content and an osmotic transudation from beyond the depths of the wound, continuing to the dressing surface.

Whoever can be so fortunate as to contrive means to secure as effective drainage based upon similar principles to be used in major operations, when required, and with as few objectionable features as in the above condition, will indeed confer a boon upon the profession. For, a method of drainage so elaborated that it will actually drain and in itself produce no evil results, will at once be entitled to the position of a therapeutic agent of the first order.

Burns, in view of their distressing symptoms, resulting unsightly deformity, and danger to life when extensive, should receive especial consideration. Their treatment should look to the relief of pain, shock and pathologic physiological functions. Those of the first degree do not usually excite any very noted abnormal conditions, while those of the second or third degrees, especially when more or less extensive, bring about changes that profoundly affect the organism and endanger life.

The treatment, to be intelligent, must therefore rest upon a thorough understanding of the pathology and abnormal functions that are present. Briefly, these are as follows:

In those of the second degree, especially when extensive on account of dehydration of the blood causing blebs, blisters, and serous oozing from abraded surfaces, the blood is rendered more dense; as a natural result based both upon physical and physiological laws, nature endeavors to re-establish the volume of the circulating medium by absorption from all the tissues. With this, there is increased absorption of morbid products of normal metabolism and of toxins, the result of destructive influences of heat upon animal tissue. There is in addition other waste products to be removed by the blood as a carrying agent that would otherwise have been excreted by the skin, which is now injured. The blood has been disorganized and its functions to this extent limited and a condition of toxemia of greater or less intensity supervenes. The urine is often suppressed, a result of renal inflammation brought about by overwork and the action of the increase and concentration of toxic bodies present in the circulation. Vomiting and diarrhoea are suggestive of toxemia and are nature's efforts at complementary elimination. Thrombosis, with its chain of sequelae, occurs as a consequence, chiefly of blood disorganization. Death is more often caused by shock and toxemia, than by other complications.

The indications for treatment are then, the relief of shock and pain, the elimination of toxins, and the prevention of infection. Sometimes the exhibition of morphine is imperative for the relief of pain, but it is to be remembered that this drug may add to renal embarrassment and should therefore be administered with caution. Wet, volatile dressings are grateful to the patient since they are cooling and therefore relieve pain. A gauze dressing kept moist with boric acid and alcohol solution, relieves pain, promotes secretion from the burned surfaces, to this extent assisting

in the elimination of waste products and preventing the maximum absorption of toxins, the product of heat upon albumenized bodies. This dressing also acts as an anodyne relieving pain and by virtue of its physical actions noted above, inhibits bacterial activity, assisting in the promotion of tissue reconstruction.

It should be borne in mind that when applied to large surfaces, sufficient boric acid may be absorbed to produce toxic symptoms. Combined with alcohol, as before noted, I think this unlikely, although to make sure the local applications could be made to alternate with sterile salt solution. An obvious advantage of these dressings in burns is the lessened necessity for frequent changing of them.

Sterile salt solution infusions should be employed with a view of diluting toxins, relieving thirst and enabling the kidneys to continue their functions. Rest, quiet and an easily assimilated diet of a liquid character are indicated. Ordinarily, the bowels should be opened by small and repeated doses of salines given in rather large dilution. Abscesses, carbuncles, boils and felons are as a general thing, found in individuals, who, from disease unhygenic living, overwork, or other circumstances, suffer from a condition of lowered vitality. Therefore, proper elimination by way of the bowels, proper diet and surroundings, rest and position, should be secured.

Abscesses, boils and felons, where pus is unmistakably present, should be painted first with pure carbolic acid until the area so treated turns white. It should now be mopped off with 95% pure alcohol, the surrounding area mopped with pure tincture of iodine and the skin incised only sufficiently to allow an escape for the pus. As Oschner states in his excellent paper, the incision should always lie within the line of demarcation or distal to it, and in the case of felons, particularly when situated within the thumb or little finger, an esmarch applied proximaly to prevent absorption, until the veins and lymphatics may be blocked by the local application of tincture of iodine after wiping out the pus from the cavity. Large boils and abscesses after incision may be washed out with an irrigator following incision, after which they are mopped out with pure carbolic acid or tincture of iodine. A gauze drain may or may not be left in and a thick dressing applied and kept moist with alcohol and boric acid solution 1-5 or stronger. After incision, boils should never be squeezed. This process is injurious to the already damaged tissues and favors a wider distribution of the agents of infection.

In the early stages, a boil can be successfully treated by washing thoroughly with soap and water, painting with carbolic acid and alcohol and applying tincture idoine to the currounding skin and with a wooden taathpick wrapped with a little cotton, dipped in pure carbolic acid, penetrate the boil through the little pustular cap to the bottom.

This may be repeated, until the interior has received a thorough application of the phenol, after which a thick gauze dressing, moistened with the alcohol and boric solution is applied and kept in place and moist for

twenty-four or forty-eight hours, when it may be treated as before. The treatment of carbuncles is practically the same, the carbolic acid being carried down and into every little pustular eminence until all have been in like manner thoroughly treated. Incisions in carbuncles are useless except for purposes of removal or when there are large accumulations of pus to be liberated, an unusual condition. Carbuncles, with very few exceptions, will almost invariably get well without resorting to incision or excision. I have seen carbuncles of the upper lip heal entirely within one week from only one treatment of the phenol, alcohol and tincture of iodine and with one dressing of moistened gauze that remained in place but thirty-six hours. Pathologists state that the inflammatory process extends laterally in the subcutaneous tissue, but the results of this treatment leads me to believe that this process of infection proceeds from above downward, the microbic agents gaining entrance through the follicular openings beyond the line of demarcation, after which the destructive, necrotic process proceeds subcutaneously in all lateral directions, enlarging the originally infected follicular openings until the skin surface within the circumscribed area of infection resembles the perforated lid of a pepper box. The line of demarcation is continuously withdrawn and reestablished so as to include within its limits all newly infected territory. It is extremely important therefore that the skin surrounding a carbuncle be thoroughly disinfected and kept so. For this purpose, nothing is superior to phenol, alcohol and iodine tincture of which the latter may be used in full or 50% strength. When these infections occur in hairy localities the depilatory of Bowdet is an excellent preliminary part of the treatment. Its composition is calcii, causticii pulveris, or unslaked lime 10.0, sodii sulphid 3.0 and pulv. amyli 10, to be separately pulverized, mixed and kept dry in a tightly stopped bottle. To use, enough water is added to make a thin paste and this spread on 1-8 of an incht hick with a spatula. After leaving for five minutes, the hairs will all be melted, when the whole is washed away with sterile water. The depilatory is antiseptic and should therefore be applied to an area sufficiently large to include all superficial infection, after which the usual soap, water and other preparatory treatment follows.

The most insignificant appearing skin prick or abrasion is sometimes the atrium or focus of extremely virulent septic infections. There is redness, pain lymphangitis and enlarged and tender lymphatic glands. There is no localized abscess or pus accumulation other than perhaps a slight serous exudation. The temperature and pulse are usually high and delirium and restlessness qute common. Incision for purposes of drainage are absolutely unwarranted because they are not only useless, but are most certain to open new avenues and surfaces for further absorpton and infection. If, as is usual, the focus is situated in a finger or elsewhere in an extremity, the usual methods as outlined above, should be employed, enveloping the entire hand and arm to the shoulder with a copious dressing liberally moistened with the boric acid and alcohol solution. Rest and position in bed, a clearing out of the bowels, a light and easily assimilated diet are

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next in importance. Internally I often prescribe a mixture of bichloride of mercury, tincture of iron chloride, glycerine, alcohol and simple syrup, each dram representing from 1-16 to 1-8 of the bichloride and 10 to 20 minims of the iron with directions to take a teaspoonful in water every three or four hours during the daytime, throughout the active period of the disease. I have never seen symptoms of mercurialism unless the treatment was persisted in after the disease had very materially subsided.

Along the lines of both the Santa Fe and Rock Island, we have had for treatment many cases of creosote dermatitis caused by handling creosoted crossties. The rubbing occasioned by the burning and itching and the mopping of sweaty surfaces, served to intensify and spread the inflammation. Our treatment was usually very disappointing until we covered the part with a dressing saturated with the boric acid and alcohol solution, which afforded complete relief at once, being followed by a speedy cure.

This treatment is equally effective in the dermatitis caused by rhus toxicodendron or poison ivy.

I am indebted to my assistant, Dr. G. S. Baxter, for this information, he being the first to use it in ivy poisoning. It relieves the discomfort at once, the dressing absorbs and removes the exuded serum, thus affectually preventing further invasion of healthy skin surfaces.

BRONCHO PNEUMONIA.

Dr. T. C. Sanders, Shawnee, Oklahoma.

Broncho pneumonia, also known as capillary bronchitis, lobular pneumonia and catarrhal pneumonia—is an inflammatory disease of microbic origin of the terminal bronchi, bronchioles and adjacent alveoli, and is characterized by variously sized areas of consolidation scattered through the lungs.

The great majority of cases of this type of pneumonia, occur in infancy and early childhood up to age of three or four years, becoming rarer in later childhood and exceedingly rare in adults. It is predisposed by unsanitary conditions, poor hygienic surroundings, previous debility, and especially by adenoids, enlarged tonsils, or any catarrhal condition of the air passages. It may occur primarily as the result of exopsure, or following a simple cold or bronchitis, but it is in nearly every instance a secondary trouble or complication of some pre-existing condition. It is particularly liable to follow in the wake of measles, pertussis, diphtheria, influenza or any of the acute infectious and contagious diseases. Mixed infection is the rule in most cases, and the micro-organisms usually revealed by the microscope are some of the following: streptococus pysgenes, staphbycoccus albus and aureus, bacillus of Friedlander, micrococus lanceolatus, and should it follow diphtheria the Klebbs-Loeffler bacillus may be also found.

The so-called inhalation pneumonia is a type of broncho pneumonia, and may be caused by the passage of particles of food or drink into the trachea and thence into the bronchi, or it may follow operations upon the pharynx or larynx and the inhalation of bits of blood clot, or it may occur in those individuals whose occupation necessitate the inhalation of dust laden air. Viz.: coal miners, stone cutters, etc. It is this form of broncho pneumonia that we are most liable to have abscess or even gangrene of the lung supervene.

The lesions in broncho pneumonia are as a rule multiple, and may be found in any part of the lung, the consolidated areas may be small, consisting of an inflamed zone surrounding a single bronchus, or it may be large formed by the coalesence of several such areas.

Broncho pneumonia develops by the regular invasion of successive portions of the lung, and there are not any clearly defined stages as in lobar pneumonia, all stages sometimes being present in different portions of the same lung at the same time.

The onset may be sudden by a chill or a convulsion, but usually it is gradual with cough, fever, increasing dyspnea, etc.

In the secondary form arising in the course of a bronchitis or of some

one of the contagious diseases, we have the symptoms of the primary condition to which is added a frequent cough of a short and hacking nature, restlessness, elevation of temperature, a marked acceleration of pluse, increased respiration 40 to 60 per minute, increasing dyspnea and often cyanosis, the alae of the nose dilate and contract, especially in the young. Expiration is more or less grunting at times.

The fever runs a remittant irregular course, usually reaching its height in from 3 to 5 days, average range being between 99.5° to 104° or 105° F. the height of the fever being a fair index to the virulence of the disease, death and low temperature occurring only in very feeble children. Likewise the cough may prove quite an index to the vigor of the child and progress of the disease, when the cough becomes feeble it would mean respiratory or other organic failure.

Children up to 5 or 6 years of age as a rule do not expectorate but swallow the material coughed up, which may be one cause of a good many cases of diarrhoea occurring with broncho pneumonia. The expectoration seen in older children is of a mucopurulent character. At the outset we usually find the ordinary signs of bronchitis without any consolidation, but as the areas of consolidation develop, these signs are replaced by the addition of consolidated areas, together with fine moist sub-crepitant rales. The areas of consolidation may be recognized by light percussion, though this is something quite difficult if areas happen to be very small, and are best recognized by using stethoscope—moving it about over lung while child is made to cry or breathe deeply, and locating areas by increased vocal remitus to resonance. The most likely place to locate these areas is just under the angle of the scapula in the lower lobe of one or the other lung.

Vomiting and convulsions may occur at outset of disease, but occurring in latter part are serious symptoms.

The appetite is usually poor and nutrition suffers, strength being rapidly lost. When the symptoms become severe, the child grows quieter and more submissive, which is a characteristic feature, and also a valuable guide as to the condition of patient.

As stated above there are no marked stages in broncho pneumonia, the symptoms vary from day to day (sometimes even from hour to hour) your patient's condition one hour or day may be what you consider fine and with every evidence of improvement, when in the next hour, or day you will find him with all the symptoms of a new attack of broncho pneumonia, the result of an invasion of some other lobule or lobules, hence the protracted course of the disease and consequent exhaustion.

The heart should be watched closely, a feeble first sound being of bad import.

The tendency of broncho pneumonia is toward recurrences and relapses, the usual duration being from ten to twenty-one days, though some cases may run one to two months, while others tend to become chronic, running several months and having a very slow and imperfect resolution.

The most serious sequella to be feared is tuberculosis, broncho pneumonia seemingly rendering the little patient very susceptible to this terrible monster. Pleurisy, enteric troubles, meningeal symptoms, and abscesses, and rarely, gangrene of the lungs are some other conditions that might complicate broncho pneumonia.

The diagnosis is not always easy and it behooves us to examine critically all our cases of bronchitis and infectuous diseases for a possible intercurrent pneumonia, which is recognized by cough, an accelerated pulse, increased temperature, rapid respiration, fine moist subcrepitant rales, bronchial respiration and areas of consolidation. It is most likely to be confounded with lobar pneumonia, especially if the consolidated areas are large, but in lobar pneumonia we have a more sudden onset and a more persistant high temperature. Plastic pleurisy may also confuse physical signs.

The prognosis is always serious, especially in infancy and up to one year of age, and next to enteric troubles this disease stands foremost as a cause of infant mortality. The prognosis depends largely upon the previous condition of the patient and the primary disease, if broncho pneumonia is secondary, and upon the course and height of the fever and complications. Those cases following pertussis and measles are the most serious. In very severe cases death may ensue in 24 to 36 hours. Statistics variously place mortality at from 20 to 50 per cent in private practice, and higher in hospital practice. The most common causes of death are exhaustion, respiratory and heart failure, toxemias and complications.

As to treatment prophylaxisis is of the utmost importance, and consists of the proper care and treatment of any catarrhal process of the air passages, and of all cases of acute infectious and contagious diseases, and especially the avoidance of too early exposure after same and the removal of adenoids and enlarged tonsils. By the strict observance of the above rules I feel that we will prevent many cases of broncho pneumonia.

When called to a well developed case of broncho penumonia it is imperative to put patient to bed and secure as near absolute rest and quiet as possible, in a well ventilated room or apartment, and endeavor to maintain a uniform degree of warmth about 70° F. at all times. A room with an open fireplace or grate is most desirable, also endeavor to keep air moist. Avoid at all times too much noise and disturbance in sick room, and especially avoid unnecessary handling of patient and too frequent examinations, which do no special good, but tend to exhaust patient's strength and patience.

The treatment in a measure is more or less symptomatic and should be supportive all the way through. The clothing and bedding should be light and at the same time warm and thoroughly protective, patients seem to do best between thin woolen blankets; the body clothing should be so adjusted that it may be taken off and on for baths, applications, etc., without much handling of patient.

There seems to be quite a diversity of opinions regarding the useful-

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ness of counter-irritants, but in my own experience I feel they have served an excellent purpose in the first few days of the disease, when there was high fever and hot dry skin, distressing cough, painful dyspnea and tightness of chest; at this time the application of a hot poultice or a mild mustard paste to the posterior surface of lungs for 20 or 30 minutes, followed by the immediate application of camphorated oil rubbed in well over entire chest will give quite a bit of relief, or sometimes simply applying warm camphorated oil, or turpentine 1 to 8 of olive oil several times daily serves the same purpose. After each use of poultices or applications, which may be as often as every 3 or 4 hours, the chest should be enveloped in a cotton or cotton wool jacket; after the first two or three days it is seldom necessary to use any counter-irritant to the chest, the jacket being all that is required.

When the bronchial secretion is more or less tenacious the cough distressing, dyspnea marked, etc., steam inhalations, to which is added tincture benzoin compound in the proportion of 1 drachm to the pint of water used as often as the requirements of the patient demand will very effectively relieve.

At the inception of the disease the bowels should be opened by five or six doses of calomel—one-tenth to one-half grain, given every half hour.

In the early stages when the pulse is full and bounding tincture of aconite in 1-4 to 2 m. doses depending on age of patient, given every two or three hours will relieve circulation.

For the cough when distressing small doses of puly. ipicac et opii or if in addition there is high fever and restlessness small doses of phenacetin or antipyrin may be added; however, the last two drugs should be used cautiously on account of their depressing effect, first try to relieve by sprays to the nose and throat, sponging, etc.

Upon the appearance of any evidence of circulatory weakness, stimulation is imperative, and our chief reliance lies in alcohol, usually in the form of whiskey or brandy from 10 to 20 m. of either every 2 or 3 hours or strych. sulph. 1-250 td $1-200 gr. given at the same interval, this dosage for a child from 1 to 2 years of age.

In attacks of respiratory failure give full doses of strychnine or atropine or make child cry by spanking, or alternate use of hot and cold applications of water to chest, which causes deeper inspirations and freer oxygenation of the blood. In the event of collapse hot mustard baths serve a good purpose.

As nutrition suffers and the strength of the patient is sorely taxed, it is important to offset this by the proper quality and quanity of food, watching digestion at all times. The food should be liquid in the form of milk, broths, etc., with the addition of digestants if need be, and given in the proper quantity every 2 or 3 hours. Any disturbance of the bowels as a result of indigestion should be met by enemas or laxatives.

I have purposely avoided mention of emetics and expectorants as they are rarely indicated, and their indiscriminate use is quite dangerous, better

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use means mentioned above, they are much safer. Sponging with cold or hot water depending on individual patient is the best means of controlling temperature or some use full bath or packs for this purpose.

Toward the end of broncho pneumonia chloride of ammonia and syrup hydriodic acid will help to clear up cough and promote resolution.

Resolution in most cases being slow and oftentimes imperfect, it is quite important to guard convalescence closely. Here our dependence lies in general tonic treatment with such drugs as ferri, quinine, strychnine, aleum morrhuae, etc., and an abundance of good food of the proper kind, and plenty ow good pure air.

In closing I wish to say that the object of this paper has not been to try to advance any particularly new ideas or theories (for there is but little new in the past few years concerning this disease) but to bring to your view and impress upon you some of the more important points, and should these few remarks help you in alleviating the sufferings of, or in possibly saving the life of some little sufferer, I shall feel more than repaid for my feeble effort.

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ABSCESS OF THE SPLEEN.

By F. L. Carson, M. D., Shawnee, Oklahoma.

The spleen is a ductless gland, essentially a lymphatic structure, and is classed among the accessory organs of nutrition. Our knowledge of its function is very imperfect. It is supposed to have an internal secretion, but as its removal is not incompatible with health, we must conclude that its function can be carried out by some other organ.

Anatomically, the spleen is the most protected of the abdominal viscera, being well up under the left costal arch, overlaid by the lungs and covered in front by intestines. It is subject to great changes in size, which unless extreme will escape detection;—percussion being exceedingly unreliable and palpation is only possible when the organ is enlarged enough to be felt under the free margin of the ribs.

According to Mayo (1), the spleen becomes enlarged as a result of:

1st—Leukemias,

2nd—Splenic Anemia,

3rd—Splenomegalia,

4th—(a) Compensatory hypertrophy accompanying cirrhosis of the liver.

(b)—Enlargements which are the result of infectious diseases, i.e., malaria, tuberculosis, syphilis and typhoid fever.

It will be seen from this classification that enlargement of the spleen from abscess is so rare as to be almost negligible, yet it is well known that such a condition is occasionally encountered.

Suppuration on the spleen is infrequently found. This is explained Arami and Nichols (2) on the assumption that it possesses strong bacteriacidal properties.

Abscesses of the spleen are divided into primary and secondary. Primary abscesses are very rare. Moynihan (2) claims that undisputed evidence of the existence of such a case is not to be found. Johnson (4) says that abscesses are always secondary.

However this may be, there remains a group of cases in whch it is impossible to discover any foci, and the only explanation is that the infection is hematogenous.

Secondary abscesses are due to foci elsewhere in the body, and may originate from infection in any organ. The process usually begins as a hemorrhage or infarct into the gland; suppuration developing later.

In connection with malaria, splenic abscess has been found. During my internship in the Charity Hospital, New Orleans, I assisted Dr. Bachelor resect a rib and drain an abscess of the spleen in a patient suffering from

æstivo-autumnal malaria. In the case I wish to report here, malaria was possibly responsible for the condition.

Miss J. C.: Age 25 years, native of Arkansas.
Occupation: Telephone operator.

Family History: Mother and father both living as are five sisters. Mother is suffering from chronic pulmonary tuberculosis.

Previous History: Patient had measles, mumps and whooping cough as a child; repeated history of malaria. At 15 years of age had 24 chills, all tertian in type; at 23 years of age had two chills also tertian. All the intervening years patient was anemic and in poor health. In 1905 she had an attack of influenza.

Present Illness: On Feb. 26th patient called a doctor who made a diagnosis of pleurisy. Until March 1st patient had no fever; on this date had a chill followed by fever; after this about 7 o'clock p. m. patient would feel chilly and fever was continous but of low grade—99 to 101°. Vomited five or six times daily. On March 21st another physician was called who made a diagnosis of "kidney trouble.' On March 26th Dr. Anderson took charge of the case and it was with him that I saw her on March 31st.

Examination: Young lady somewhat emaciated, mucous membranes pale, pulse rather rapid but regular, temperature 99½° F. In fact the patient presented the appearance of suffering from a mild sepsis. There was a mass in the left loin extending from the costal margin to the anterior superior spine of the ileum in front and filling the lumbar region posteriorly. On percussion over the mass there was flatness only. The urine contained a small amount of pus.

The liver dullness was normal, no rales in the lungs, no cardiac murmurs and no tenderness elsewhere in the abdomen.

A tentative diagnosis of peri-renal suppuration was made, operation was suggested and accepted.

Operation: April 2nd, 1908: The region of the kidney was explored by an aspirator with negative results. An incision was then made and the kidney palpated and found normal, but a mass was felt farther forward, so the wound was closed and another opening made through the left semilunar line. On opening the peritoneum an enormous mass proving to be the spleen, was encountered.

While exploring and attempting to deliver the greatly enlarged spleen an abscess containing about six ounces of thick, yellow, non-odorous pus was ruptured. The abscess was located on the inner concave surface, near the tail of the pancreas. Rubber drainage tubes were inserted and the wound closed.

The patient made a tedious recovery and is well at the present time, three and a half years since the operation.

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It is worth mentioning that while the abdomen was opened and before the abscess was found, that the ovaries, tubes, appendix and gall bladder were palpated and nothing found.

(1) W. J. Mayo, Journal A. M. A. Vol. 54.

(2) Garrow (Quoting Adami & Nichols) Bryant and Buck, Vol. 8.

(3) Moynihan, Keen's Surgery.

(4) Johnson, Annals of Surgery, Vol. 58.

INDICATIONS FOR TONSILLECTOMY.

Dr. J. M. Stooksbury, Shawnee, Okla.

This subject embraces points of interest of equal importance to the physician engaged in general practice, the specialist who devotes his entire time to this particular field of practice, and the patient who is afflicted with the diseased tonsil as well. The point of interest perhaps which concerns the general physician most, is to be able to conscientiously advise his patients for their best interest; however, there are times when this becomes a trying task on the part of the physician to decide, especially if the patient has scruples in regard to the surgical treatment of the tonsils. But just at this decisive moment one word spoken by the physician may be the turning point on which will depend the future success and happiness of the individual; or on the other hand a loathsome life destined to be full of failures, disappointments and suffering incident to a diseased tonsil.

The specialists' interests are as a matter of fact equally as important for this reason, for in a measure the same degree of success which may result from the specialist's procedure of care and treatment of such cases as may be referred to him by the general physician will establish that degree of confidence in the physician of the ability of the specialist, and the future relationship between the physician and specialist will rest entirely upon these conditions. Since it is true the specialist looks directly or indirectly to the general physician as a source for the majority of his work, it stands to reason the specialist must first show himself master of his specialty before he can hope to gain the confidence of the physician. The indications for tonsilectomy are not so important as is the operation itself, for seldom does it ever occur that the tonsils are removed unnecessarily; should a healthy tonsil be removed it would be no serious mistake in the least to the patient, but on the other hand, to neglect the proper treatment of a diseased tonsil by the physician or specialist is next to criminal negligence on their part.

It is conceded by our most competent clinicians that the most satisfactory method of dealing with a diseased tonsil is the complete enucleation including its investment capsule. While it is true that measures of less radical procedure will in some cases give relief to the distressing condition—such as the actual cautery to the crypts, the incision of the crypts, the removal of the pent-up debris from the crypts, and the partial removal of the tonsil. Close observation for a year or two following cases treated after these methods have clearly proven that the tonsil is still the seat of diseased processes that existed prior to the treatment above mentioned, and in addition to the continuation of the diseased processes, the tonsil

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was found to actually increase in bulk, and in many instances larger than before operation.

On the other hand, if the tonsil is enucleated within its capsule the diseased processes of the tonsillar tissue and fossa will never recur, for the fact there remains no tonsil tissue from which a new growth can spring. There has been cases reported, however, where the tonsil has reappeared after tonsilectomy, but on close examination it was found that a small portion of the tonsil had failed to have been removed, as well as the entire fibrous capsule was found intact. It is a fact, occasionally, after complete removal of the tonsil, that the tonsillar fossae will take on an inflammatory reaction, but after the second year following the operation it is seldom ever witnessed.

It is clear to my mind, therefore, after carefully considering all the clinical reports obtainable, that a majority of the cases heretofore requiring only such treatment as incision, cauterization, partial removal of the tonsil, which has resulted only in temporary relief, should be operated upon by the complete method, whereby the tonsil, including its entire capsule, is removed.

The faucial tonsil is, in reality, a large compound lymphatic gland; from its profuse vascular and lymphatic relationship to tissues and also being exposed constantly to pathological germs, it is not only a site for local changes, but local manifestations of a constitutional condition, and again, the tonsillar structure is such, that when subjected to an ulcerated condition it may be the source of systemic infection, since it is proven that a pathological tonsil may manifest a serious local condition and a local manifestation of a systemic blood dyscrasia, and a fruitful source for absorbing into the circulation obnoxious substances and pathological germs. It now suggests to us some of the conditions and indications for surgical interference.

In the following paragraphs, it should be carefully noted, that the indications mentioned, have special reference to enucleation of the tonsil in its entirety, including its fibrous investment capsule, technically known as tonsilectomy.

Indications: (a) Recurrent attacks of tonsilitis, which do not have as exciting causes, pharyngeal or aural complications demand removal of the tonsils. But I would warn against an operation during an acute attack, for to do so oftentimes is a fruitful source of infection of the wound and also of the deeper adjacent structures, which might lead to a serious termination. It was my misfortune in one instance which I recall to have an infected wound after tonsilectomy. Man, age forty years; apparently healthy in every respect. The tonsils, on inspection, gave no appearance of any acute trouble other than slight irritation, and history by patient, of occasional "sticking" pains in region of tonsil. I operated under the usual antiseptic precautions, using local anaesthesia. I feel confident in the assertion that the infection was not due to neglect on my part, but that there was already acute infection lurking in he hidden parts of a

submerged diseased tonsil, and by operating at this particular period, opened up new avenues through which infection spread rapidly. This would not have occurred had I taken the time and precaution which is always necessary in all cases giving such a history, to first treat the tonsil two or three days previous to operating.

(b) Nasal catarrh and aural diseases are often true indications for tonsilectomy. One very eminent surgeon has said that a large per cent of those cases applying for treatment for catarrh and diseases of the ear there is no plain evidence of a hypertrophied tonsil on first inspection of the throat, but, if you will cause the patient to gag, which relaxes the pillars and uncovers to our view an enlarged portion of the tonsil. Such a diseased tonsil is constantly manufacturing sufficient germ products to affect the adjacent structures; therefore the hidden or submerged tonsil, is oftentimes a greater source of infection than is the prominent tonsil, whose crypts are uncovered. It is easily explained why a diseased tonsil will give rise to aural infection, when we remember that the palatopharyngeus muscle extends to the pharyngeal orifice of the eustachian tube and inflammation of the tonsils and pillars might extend along the pharyngopalatine fold to the mucosae of the tube, and thence to the middle ear, and repeated attacks of acute infection of the tonsils would interfere with the palatopharyngeal fibres, and thus impair the muscle mechanism that controls the patency of the tube.

(c) Enlargement of the glands of the neck. As the tonsil is a part of the lymphatic system, its relationship to the glands of the neck is quite intimate, therefore, when there is a history of frequent enlargement and tenderness of the glands of the neck, it is good evidence of a diseased tonsil as the chief source of infection, and should be ablated.

(d) When the crypts of the tonsil are examined and found filled with foul debris and bacteria, and after clearing them of this foul material they seem to improve for awhile but frequently recur, the indication for tonsilectomy is highly necessary.

(e) Laryngitis with hoarseness is often due to tonsillar disease, hence the tonsil should be carefully examined and if the crypts are found in a diseased state, or if the tonsil is hypertrophied, it should be removed.

(f) Hypertrophy alone, of the tonsil, is evidence of a diseased condition, for in a perfectly normal throat, the tonsils are hidden from view by the pillars, for this reason, as a rule, the tonsil seen projecting out into the throat is a diseased one. There is a divided opinion among the profession upon this point. Some writers hold that the tonsil is an essential organ of the body, while others believe it to be a pathological entity. Bacterial infection, when continued very long, causes either hypertrophy or hyperplasia; when thus changed its function as a lymphatic gland is impaired or lost, and the physical economy is best served by its complete enucleation.

(g) Chronic follicular tonsilitis is another condition which offers very little hope of a cure with the ordinary simple treatment. Even if the

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crypts are obliterated by the use of the actual cautery, the extreme feeble vitality of the tissue predisposes to infection and inflammation; for this reason tonsilectomy is evidently indicated.

(h) Follicular pharyngitis is often caused by chronic suppurative follicular tonsilitis and it has been known to disappear entirely after the tonsils have been removed.

(i) Tubercular infection often has its origin in the tonsils, and when such a process is demonstrated or even suspected, the tonsils should be enucleated at once, and thus check the absorption into the circulation.

(j) Recurrent articular rheumatism, which sometimes follows an acute attack of tonsilitis, is a plausible indication for tonsilectomy. Therefore it is clear to my mind that we are just entering upon a new era of studying the relationship one pathalogical tonsil bears to the local and general systemic infection, and ere the dawn of a few short years we will not be groping in the darkness of fancied theories along this particular branch of surgery, but will be practicing our art upon more sound and proven facts.

AUTO-INTOXICATION.

J. M. Byrum, M. D., Shawnee, Oklahoma.

Auto-intoxication as we are trying to understand it today is not the auto-intoxication that was taught us when we sat in the bull pen some fifteen years ago. Perhaps it is a true propheey to say that it is not the same this evening that it will be fifteen years hence. The physiological chemist has been busy with his reagents and is only beginning his engagements; the microscopist has been diligently using his slides and is still "seeing things;" the clinician is ever watchful at the bedside, in the diet kitchen, and at the toilet. The things we eat today do not seem to take the same course in digestion that they did when we proudly accepted that diploma as evidence of complete knowledge of medicine. We did not know it all then; we do not know it all this evening.

The definition of auto-intoxication as it appears to me this evening is: A toxemia caused by the perversion of the bacterial digestion and a failure of the anti-toxic and other glands of the system to properly care for such toxins. Some twenty years ago, Bouchard gave publicity to his views on this subject but Bouchard then wished to include all the toxemias of a perverted glandular activity; all the toxemias of the various infections introduced from without the system; the toxemias of perverted metabolism; and the toxemias we now recognize as ptomaines, introduced into the digestive apparatus with the food or water. There is also a toxemia of absorption which is not properly included in auto-intoxication, as from pus cavities, ulcerated surfaces, the malignant conditions and a great many others.

When the end products of bacterial digestion, from any unnatural condition of the alimentary canal, are produced in excessive quantities or when the protective glandular system is unable to care for all the toxins produced, the excess is thrown into the circulation and a poisoned condition exists—we have auto-intoxication.

With this definition of the subject, it will perhaps be necessary that we revise our old chemistry of digestion. Within the alimentary canal are two perfectly organized systems of digestion; that by which the enzymes convert starches into sugar, emulsify fats and transform the albumins into peptones; and that much more complicated as well as complete digestion which is due to the bacteria which inhabit the alimentary canal. I will not here undertake to say that these microbes have their habitat in the digestive tract but will say that they have a useful, if not an indispensible, function in this digestive process. Of these several families of bacteria, there are some which thrive only in the starches; others, in the fats and still others, and these are the most numerous, in the albumins. More than

this, the albumin is a natural culture medium for nearly all the bacteria, depending upon its reaction whether acid or alkaline. In the capacity outlined, these bacteria are supplementary to the enzymes and perhaps, physiologically, do many things which the enzymes can not do. What this complete supplementary function is, we can not say but we have it on good authority that they render assimilable many foods which the enzymes are incapable of handling, cellulose, for example. If they can do this, it is but fair to presume that their presence in the digestive tract is not accidental. If they were only an accident, why is it necessary to have the systems of antitoxic and other glands standing guard, at all times, between them and the general system? That they are indispensible, seems proven by aseptically taking guinea pigs from the mother's womb and feeding them on a well regulated but aseptic diet. The animals do not thrive as well as the control animals. Fowls so taken and treated, die while the controls do perfectly well.

Aside from this useful function, these bacteria have another function. With equal facility, they convert the digestive tract into a veritable laboratory of poisons. Whether this process of separating the poisons from the elements to be absorbed for assimilation is a natural and protective function or whether it is a perversion, I am not prepared to say. It is perhaps both.

It is not the purpose of this paper to go into the complex chemistry of the action of these microbes upon the albuminous molecule nor of the resulting toxic bodies produced by its decomposition. At present, we are content merely to mention the fatty volatile acids, the ptomaines and leucomaines, the aromatic bodies and the various gases as being a resume of the putrefactive processes, leaving it to a future paper to go into the analysis of the various bodies composing these complex groups. The constant and ever changing formation of these loose compounds and the easy substitution in the various radicals, account for the almost endless number of toxins with which the system is burdened. Within the same system a kind and conserving Providence has placed an anti-toxic process of equal amazing chemical complexity in which there are more substitutions in other similar or different radicals and by which the toxicity is completely overcome or very materially modified and made ready for easy elimination or for further synthetic use in the economy. This anti-toxic process has been ably presented this evening by Dr. Hughes in his essay on Immunity. His "haptophores" and other illustrations of an elastic and accommodative vocabulary, are quite new to us, yet advancing medicine compels us to lend an attentive memory. We are just beginning to learn why we continue to live and at the same time harbor a laboratory of such deadly poisons.

The designing Architect of our body did not leave the anti-toxic glands alone in the defense of the system against auto-intoxication. The other factors are the mucus membrane and the liver, all three defenses placed between the source of infection and the general system.

The mucus membrane of the digestive tract, itself, has at least two separate defenses. First, the secretions and second, the cells. By its secretions, a great many substances are precipitated and expelled from the bowel as excreta. Other substances are directly antagonized by the digestion of other food elements than albumin. The acid reaction of the small intestinal tract, maintained by the microbic fermentation of the carbohydrates has much to its credit in protecting the albumin derivatives against the proteolytic anaerobic bacteria which would otherwise be very active in the alkaline intestinal juices. This acidity is further augmented by the normal flora of this region, the two principal of which are the B. coli commune and B. lactis aerogenes. It might be well, in passing, to remark that it is upon this principle of reaction that the putrefactive disturbances are so marked in enteritis in which inflammations, the contents of this gut are neutralized or rendered alkaline.

The cells of the mucosa are protective because they directly absorb hexone bases and animo acids and convert them into synthetic albumin, one of several illustrations in the organism where two or more poisonous compounds are united into useful, living tissue. These cells also have an anti-toxic influence, perhaps in a similar chemical process of substitution or abstraction in uniting several deadly poisons into compounds less noxous or completely harmless. In 1887, Charrin and Cassin showed that a series of toxins lost their toxicity completely when introduced through the digestive tract; whereas, a dose fifty times less strong would prove fatal when introduced directly into the circulation.

The second line of defense is the liver. All the toxins escaping the mucosa of the intestine or which are rendered into less harmful compounds, are gathered up by the portal circulation and dumped into the liver. The sodium and potasium properties are used up principally in the formation of bile. The amido acids and ammonia are reconstructed into urea. Ammonia is a deadly toxin while urea is but slightly toxic. The nucleins and xanthis bases, both far from being non toxic, are transformed into uric acid, which is scarcely toxic and is rather easily eliminated. The aromatic bodies, most of which are very toxic, are combined with sulphuric and glycuronic acids into compounds less toxic and more readily eliminated. And so on through the list of entero-toxins. It is said that the liver destroys two-thirds of the poisons of digestive origin. Hepatic insufficiency, then, is an important factor in auto-intoxication. This insufficiency will account for many cases of auto-intoxication when the putrefactive changes in the digestive tract are not above normal. If properly interpreted, "biliousness" expresses this condition about as well as to say "auto-intoxication of hepatic origin."

The urine in auto-intoxication is a subject too extensive to receive extended consideration in this paper. It is an index our masters followed in ferreting out the conditions included in the subject of this paper. We will do well to have a thorough analysis of the urine in all abnormal conditions of the system. Renal insufficiency alone will lead to a reten-

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tion of the various products of albuminous putrefaction and consequently auto-intoxication.

In closing this paper, I must quote from Combe of Switzerland, that "We can see, that, whether we consider the anatomy or physiology of the digestive tract, whether we examine the symptomatic picture presented at the clinic or whether we should seek in biological chemistry or experimental physiology for decisive and scientifically demonstrated proofs, we find everywhere evidences of the existence of intestinal auto-intoxication. This condition presents a particular etiology, a distinct pathogeny, a well defined clinical picture and symptomology, a very special prognosis and treatment; more than enough to make an entity of it and more than enough to justify the detailed study of gastro-intestinal auto-intoxication. It explains the symptoms of which our patients complain, and better than any other does it indicate the most suitable therapeutic means to employ."

IMMUNITY.

By J. E. Hughes, M. D., Shawnee, Oklahoma.

The study of immunity in its different phases, and the various processes by which it is established, has given us a new and growing field of true scientific worth.

Unfortunately, in the elucidation of this subject, new words and strange phraseology have sprung into use, which are foreign to the vocabulary of most medical men.

But since sero-therapy and vaccine-therapy have so much to offer in the prophylaxis, diagnosis and treatment of disease; and that so many physiological and biological problems are being brought to light, it behooves every physician to familiarize himself with these immunizing bodies.

We all know that diphtheria anti-toxin will cure diphtheria, that the serum of a typhoid patient will clump typhoid bacilli, and that phagocytes will injest and destroy certain micro-organisms--but how and why these changes take place we have been too reluctant to inform ourselves. In the explanation of these phenomena observed in the process of immunization, Ehrlich's "side chain" theory affords us the best working hypothesis; and in the light of our present day knowledge this theory conforms to what we know to be most nearly exact. This theory is that cells are bound to other cells or other organic substances by certain bonded factors called receptors. These receptors are the "side chain" of Ehrlich and are analogous to the structural formula of the benzine ring of organic chemistry, in which complex molecules have the property of combining with other atoms, forming new chemical substances. Likewise the protoplasm of the cell through its receptors or side chain are bound to other substances, whether it be a food or toxin, either to nourish or destroy the cell. This union is generally believed to be, and according to Ehrlich, is a chemical one. Its uniting groups are known as the haptophore or binding groups.

Receptors are not always simple in structure. We have receptors of the first, second and third order. Some have only the haptophore portion. Others have, in addition to the binding portion, the toxophore or poisoning group. While others still more complex have a double haptophore, and is called an amboceptor.

Let us deal with something more tangible. Take a case of diphtheria for example, diphtheria bacilli of the throat secrete a soluble toxin which finds its way into the general circulation. This toxin body also possesses a hextophore and a toxophore group. Now if the cells of the body have receptors, which will unite or fit the haptophore of the toxin there will be a union and an injury to the cell. On the other hand if there are no re-

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ceptora for this particular toxin there will be no harm done. This is natural immunity. When the cell is injured by the toxin the equilibrium of the cell-protoplasm is disturbed, and according to Weigert's law of tissue repair, the tissue responds to the formation of new receptors. This stimuli results in an overproduction of receptors—a hyperplasia. The excess of receptors are soon cast off as anti-toxic bodies to float free in the blood plasma, still capable of combining with the toxic bodies through its haptophore group. In this manner the body cells are saved from further injury, and the child may recover from diphtheria. This is acquired, active, antotixic immunity.

Now let us see what diphtheria antitoxin does, and how it acts as a preventative and cure. If we inject a horse with diphtheria toxins in small and increasing doses, and so stimulate his cells to produce free receptors, then bleed him and inject his serum containing these receptors into a diphtheria-poisoned child, these receptors or anti-toxic bodies not only unite with the toxins which are present in the blood serum, but are capable of wresting from the cells the toxins which have already united with the receptors of the cells. Thus the child is saved by antitoxin. This is acquired, passive, antitoxic immunity.

Many observers hold that the diphtheria bacilli secrete two toxins; one which produces the active symptoms of the disease, the other of longer incubation period, having a greater affinity for nerve cells. This toxin produces the so called diphtheritic paralysis.

This special predilection of toxins for nerve tissue is best typified by the toxin secreted by the tetani bacilli. Experimentally when this toxin is injected intravenously, it disappears from the blood in a few minutes, to appear in the ganglionic cells within two hours from the time of injection. In test tube tetani antitoxins and tetani toxins neutralize much more slowly than do diphtheria antitoxins and diphtheria toxins. This phenomena explains why antitetanus toxin is not curative but only a preventative.

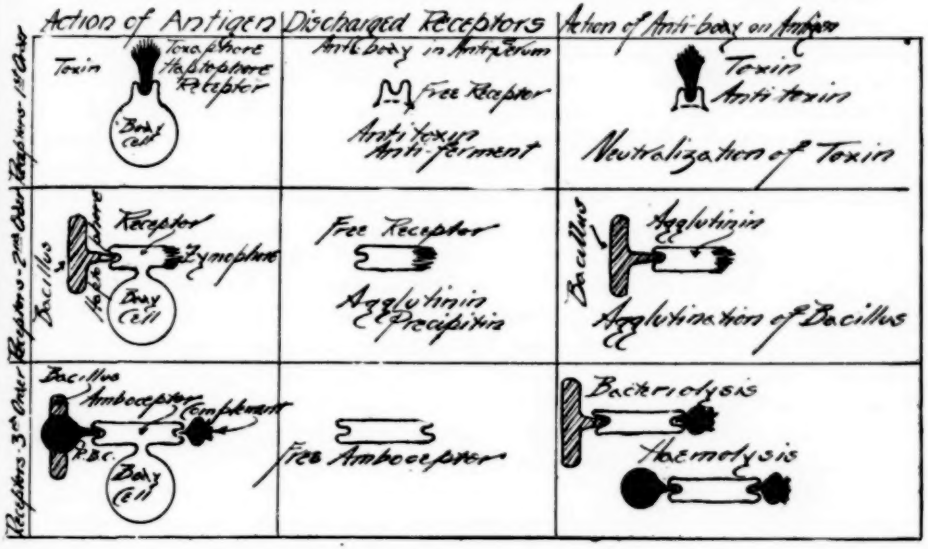
So far the receptors have only served as neutralizing bodies. Antitoxins are not bactericidal. They will not kill the bacteria. In fact, diphtheria antitoxin and tetanus antitoxin are very good culture media for their respective bacteria.

Now we will pass to the study of receptors of the second order. These are more complicated in structure. In addition to their haptophore group, they possess a toxophore or zymophore portion. These are double portioned receptors, which serve as modifying bodies only. To this class belong the agglutinins, precipitins and complements.

The Widal test for typhoid is dependent upon the agglutinins. The typhoid bacilli are in the blood; the bacilli themselves contain the agglutinable substance called agglutiniongen. The endotoxin of the bacilli stimulate the cells to the formation of new receptors, which bodies are the real agglutinins. Now when the serum of a typhoid patient containing these free agglutinins, is mixed with a typhoid culture the bacilli become

non motile, shortened and stick together forming clumps. This is agglutination. Remember that the agglutinins do not kill the bacilli—they are only modifying bodies, and are not the bacteriolytic bodies which destroy the bacilli.

The medico-legal test for human blood is perhaps the most striking illustration of precipitins. If a rabbit is injected with small and increasing doses of human serum, its tissues are stimulated to form new receptors, which fit human serum only. These cells soon shed their receptors



into the serum. Now if the rabbit serum containing these free receptors is mixed with human serum these receptors through their haptophore group will unite with certain chemical substances in the human serum, and the zymophore will precipitate them.

We have now come to the consideration of receptors of the third order—i. e. the bacteriolytic, haemolytic and cytolytic amboceptors. These are far more complex and more difficult to understand.

We have seen how the receptors of the first order could neutralize bacterial toxins, how receptors of the second order could maim and cripple bacteria by agglutination. We will now attempt to explain how bacteria and other cell bodies are actually destroyed.

Let us take typhoid for example, and see how typhoid bacilli are destroyed; and see why an immunity is established. The endotoxins of the bacilli unite with certain receptors of the body cells causing the formation of many new receptors, which soon become free bodies in the serum. These bodies are unlike the agglutinating bodies in that they possess two haptophore or binding groups. One portion known as the complementophilous-haptophore the cytophylous-haptophore. This body is neither toxic or antitoxic, nor in itself bacteriolytic. Now there is always present in

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the human serum a body known as the complement, its origin is not definitely known; leucocytes are at least one of its sources. It is likened unto a toxin. This is the body which unites with the complementophilous-haptophore of the amboceptor; the cytophylous-haptophore unites with the receptors of the bacteria. Then the complement through its intermediate body destroys the bacteria. This is acquired, active, antibacterial immunity.

Now suppose we take a culture of typhoid bacilli and kill them by heat. Then inject the proper number in a normal individual, say three doses extending over a period of four weeks, what change will take place in the serum of the individual? Probably immediately after each injection we will have an increased susceptibility to typhoid. This period is known as the "negative phase," caused by a temporary decrease in the complement and opsonins of the serum. These soon return to normal. New amboceptors are rapidly formed then we have an increased resistance to typhoid known as the "positive phase." This is acquired, passive, antibacterial immunity.

The treatment of typhoid with bacterins can be of little value except in possibly cases of relapse. Here bacteria may stimulate the formation of more active amboceptors, and thus hasten immunity. No doubt just such a condition exists in the bacilli carriers of typhoid. Here the bacilli and tissue cells have long since ceased their warfare, are under a flag of truce, and require new stimuli in the form of fresh typhoid bacilli to stimulate the formation of more active bacteriolytic amboceptors.

But in an active case of typhoid when there is already a profound toxemia, bacterins can do no possible good and may do harm, by adding more fuel to the fire. We must not forget that the bacteriolytic body is not the amboceptor alone, but is the amboceptor—complement—complex.

In hemolysis a very similar phenomena to that of bacteriolysis is observed. Since a very early time it has been known that it is not possible to substitute the blood of an animal for that of a man; and in a general way the same law holds with animals of different species, i. e. the blood of one animal is poison to the blood of another.

Now, if we inject into a rabbit small and increasing doses of washed red blood corpuscles of the sheep, we will establish in the rabbit an immunity against sheep's corpuscles. Free amboceptors will appear in the rabbit serum, and if this serum is mixed with red blood corpuscles of the sheep, the complement will unite with the amboceptor, the amboceptor with the red blood corpuscles and hemolysis will result.

This hemolytic system is utilized in the specified serum test for syphilis, which test is dependent upon the deviation or fixiation of completment. That is, if the patient has syphilis his serum contains antibodies or amboceptors, which will unite with the infectious virus or antigen, and fix or bind the complement in the serum. Now if we add washed sheep's corpuscles and their specific antibodies the amboceptor, which were formed in the rabbit's serum, hemolysis will not result because the complement of the serum

has been already bound. On the other hand if the patient has no syphilis, there will be no antibody or amboceptor in his serum to unite with the antigen and bind the complement, then when sheep's red blood cells and their specific amboceptors are added, hemolysis will result because there is still free complement in the serum.

The phagocytic theory of immunity, as advanced by Metchnikoff, would appear in direct opposition to the theory held by Ehrlich. However, this is more apparent than real, for if we will closely study and compare these theories, while we will find little in common, we will be surprised to find so few contradictions.

Metchnikoff would explain all immunity by phagocytosis. Ehrlich would not accept such a broad assumption, admitting that phagocytes are of great value in combating certain infections, especially those which are not followed by any immunity, nor accompanied by the development of antitoxic or bacteriological properties in the serum. Infections produced by the pneumoccus, streptoccus, and staphyloccus are examples of this class. The ability of phagocytes to injest and destroy these micro-organisms is dependent upon the opsonins of the serum. Opsonins, meaning "I prepare food for," are independent of all other antibodies thus far studied. Metchnikoff recognized their presence in the serum and called them "stimulins"; believing that they acted upon the leucocytes stimulating them to injest and destroy bacteria. More recent experiments by Wright and Douglas have served to disprove this assumption. Opsonins do not stimulate the leucocytes to phagocytic activity, but act on the bacteria, so sensitizing them that they may be more rapidly injested and destroyed by the phagocytic cells.

This power of the serum to sensitize bacteria for injestion by the leucocytes is expressed by the opsonic index. By this means we measure body resistence to infection. As in pneumonia, the first few days we find the opsonic index low, and in rapidly fatal cases, the opsonic curve or index does not rise above the primary depression, but sinks lower and lower. In cases which recover we find the opsonic index the highest just prior to and immediately following the crisis. This phenomena may explain the crisis of pneumonia, and how temporary immunity is established.

DIFFERENTIAL DIAGNOSIS OF BENIGN AND MALIGNANT TUMORS.

Dr. J. A. Walker, Shawnee, Okla.

Mr. President and Gentlemen of the Pottawatomie Medical Society:

The subject you have assigned me is not, of course, of my own choosing, hence all that I can promise you is that I will do the best that I can for you. Tumor is now an indefinite term. It used to be defined any enlargement or swelling. But recent pathology has eliminated a great many of the tumors of the older pathologists and we now class them in their proper category, and other eliminations will gradually come until the word tumor in the old sense will be lost sight of, at least by our Pathologists. Before ye can hope to differentiate between malignant and benign tumors we will have to know something of the histogenesis of a tumor formation. What is a tumor, and why should it grow on a normal organism? These questions are shrouded in the maze of facts and fallacies from the earliest dawn of medicine down to our own time. We know more of tumors than did our ancestors, but of the why, very little more. Since the dawn of medical history, scientists have been trying to assign a definite cause for the abnormal growth that they call tumors, but it is still shrouded in the mazy labyrinth of the unknown and seemingly ungnowable. The other dilemma is a proper and scientific classification of neoplasms. When one has built up a beautiful theory of the different forms of tumors, the light of recent knowledge divulges numerous faults and his air castles are almost or quite demolished.

Tumors were first divided into two great classes, according to their clinical manifestations, benign and malignant. And for a great many purposes it is a good working division. Then as pathologic knowledge advanced it began to dawn on the pathologist that the system was made up of many different kinds of primary tissues and that tumors originated in the first instance from one of these primary tissues, and if transplanted to other tissues retained the characteristics of the tissue from which the original tumor arose.

The etiology of tumors is of the greatest concern to all who are interested in this, the most mystifying of all pathologic subjects. While great light has been thrown on it by Virchow, as an original and primary thinker, and by all those who have followed him in his work on "Cellular Pathology," yet those neoplasms which yet remain that haven't been found to be caused by some micro-organism or a special inflammatory process, are yet buried in the debris of as deep darkness as at the very dawn of medical history. And when all is said and done it must be confessed that the essential cause of these tumors has eluded discovery. The theory of embryologic rests or foetal cell isolation may and can be

the cause of some tumors, but will not answer for any considerable number. The further we attempt to go into the origin of abnormal growths the further we seem to get from the real basis underlining them. So we must content ourselves with what knowledge that is available and look to the future for the solution. One author will define tumor as an autonomous new growth not the result of an inflammation. Another tells us that is a pathologic new formation of tissue. As to the cause of this pathologic new or autonomous growth we will have to refer you to the future. There are a few differences between malignant and benign tumors to which I may now call your attention. I shall not attempt to classify them, other than to say that a task which no one has succeeded in accomplishing, I am too wise or too ignorant to attempt. The basis of the clinic classification rests on the benign or malignant tendency of the neoplastic growth. Where a tumor is permitted to remain and is capable of doing harm only by its bulk or situation, it is called a benign growth. A tumor which proves destructive to the tissues in which it grows by infiltrating or insinuating its cells into them, or infects the lymph gland which receive the lymph from the area where it is situated or has a tendency to return after removal, is termed a malignant growth. Independent of the course and termination of tumors, there is a great difference in their anatomic construction. Benign tumors are identical, or almost so, with the tissues in which they grow. A lipoma is of normal fatty tissue. A fibroma is of ordinary fibrous tissue, and so on through the whole benign group. There are some exceptions to this rule, but we will not burden you with them. Hence these neoplasms have been termed homologous tumors. Malignant tumors, on the other hand, embody embryonic structures which are very unlike the tissue in which they are situated. As, for example, a sarcoma is a malignant neoplasm of connective tissue, and its cells and fibres are of an embryonic type and very unlike any of the adult forms of connective tissue. A cancer is a malignant growth of epithelial origin, and yet its cells are of young foetal type and are dissimilar from any mature epithelium of the body. This form of new growth is called heterologous growth. Another and later author has called these two classes homomorphic and heteromorphic, or later and better expression is typic and atypic, and after we have said all this and more, we must return to our old clinical classes of benign and malignant. All tumors, both benign and malignant, originate in one of the three primary foetal layers of embryologic development. Farther than this into the embryology of these conditions, I falter to go. The number of tumors have a great bearing on their malignancy. There may be one or many benign growths, and very seldom more than one malignant, and if more than one, it is nearly invariably a secondary tumor, as two primary malignant tumors have been found exceeding rare. It is one of our most trustworthy signs to find metastases in distant parts of the body, for, as said above, benign neoplasms have no tendency to form metastases. When once they are removed they do

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not return, and if we remove what we consider an innocent tumor and it returns, we know our diagnosis was at fault, or that we were not complete in our work, but that we left some part of the growth behind.

Glandular infection is another of our most important signs of malignancy and demonstrates their real harmful tendency. However, a tumor may remain localized for a long period of time before the lymph glands are involved, as said above infiltration of the cells of the growth into the surrounding or adjacent tissue is a tendency of all malignant tumors. The cells creep out from the sides of the growth and insinuate themselves into the tissues in which the tumor grows, and you can not definitely tell where the neoplasm ends and the healthy tissue begins. Whereas a benign growth has a definite capsule which separates it from the surrounding structures. Tumor which grows rapidly and which has not a definite limit or demarcation and shows a disposition to adhere to the skin has all the ear-marks of a malignant growth. However, a sarcoma or a carcinoma may grow very slowly for a while, but as time goes on when they begin to grow then these manifest themselves and ere we are aware the growth has run wild and we stand by helpless and say, "if I had known." The color has some significance, for a typic growth will practically be of the color of the tissue from which it sprang. Whereas an atypic growth may be of any color from red, white, black, green or purplish, and a tumor with these variegated colors must be looked upon with suspicion from the very beginning.

EDITORIAL

DR. HARVEY W. WILEY.

After many years of faithful and efficient service in the Department of Agriculture as Chief of the Chemistry and Pure Food Divisions of that Department, Dr. Harvey W. Wiley suddenly handed in his resignation, it is said by the daily press, after an extended interview with Mr. Wilson, Secretary of Agriculture.

Dr. Wiley's resignation brings conflicting emotions to all of those who have followed his work and achievements even in the slightest degree. After many years' patient work he made of his bureaus component parts of the Department that came to be reckoned by the exploiters of impure products as the greatest detriment to their continued existence. Almost single handed, and often with direct and powerful hostility from the officers above him, he brought to a reckoning many of the former frauds of the pure food world and came to be considered as one of the Nation's safeguards.

This work on his part has excited the admiration of all men worthy of the name, irrespective of party on account of its general disinterestedness and impersonality: Without fear or favor he has investigated and run down the various violators of the law; has given clean bills of health where deserved and withheld them where undeserved. In this work he has naturally encountered many enemies and run counter to the wishes and beliefs of some people. In some instances his decisions have met with protest from seemingly respectable sources, but an investigation of these few cases shows one that the differences are more technical and theoretical than practical. Whenever it has been possible for a flaw to be found in his decisions and work, that flaw, even of the most insignificant character, has been pounced upon by his enemies and exploited by hostile press and publicity bureaus to the people of the country as evidence of his falibility. These bureaus, it appears, have taken their criticism largely from the columns of the different trade food and grocery journals of the country and have sent from their headquarters in Washington Square, New York, skilfully worded and prepared expressions as to Dr. Wiley, his work and their opinions of it to the different publications in the hope that somewhere their propaganda for the purpose of discrediting a good, faithful servant would find fertile soil. In this connection it would be interesting to the people to know just what percentage of his opponents are also opposing the enactment of the National Department of Health Bill into a Law, for it is rumored that Dr. Wiley has stated that his sole attention for a time will be given to the aid of this measure and while this

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cannot be verified at this time, the answer would be of interest to the friends of this proposition and to those of Dr. Wiley.

Dr. Wiley has in the last few months come into close touch with every reader of the daily news by his investigation at the hands of Congress, his complete exoneration at the Committee's hands, the approval of the findings by the President and finally the discrediting of his enemies in the Department. This finding has, indeed, reacted severely on the head of Mr. Wilson, and to such an extent that it is extremely doubtful that he will ever recover his lost political prestige.

The resignation of the Chief could not have come at a more opportune time; just after a complete vindication, at a time when he has risen as high as a professional man can in the estimation of his people, and when the eyes of the country are focused on a coming political contest between the great parties, both of whom have declared in substance for the principles advocated by this great man.

No official statement has been made by Dr. Wiley giving reasons for his actions, but those who know him believe that whatever they are they are good and sufficient. The daily press of the country, that is, the respectable element, believe in Wiley and believe that his work will go on and inerase in importance to the American people and that eventually the principles for which he stands will become as they should, the cardinal principles of the people, who have a right to demand that their foods and drugs be maintained in purity.

LESSONS FROM OUR EPIDEMIC OF MENINGITIS.

The lull from our attacks of epidemic meningitis has given us time to stop and reflect to some extent on the results of the newer knowledge and application of recently advanced treatments and arrange them in our minds for possible use in the future.

Perhaps there is a clearer knowledge of the affection in the minds of the general practitioner of medicine today in the southwest than anywhere else in the United States, due to his opportunities of observing and treating the cases in his own particular locality and among the more fixed principles involved from a closer observation and deduction may be mentioned many, but only the more important will be noticed here.

The diagnosis may be safely assumed if the spinal fluid is turbid but the absence of turbidity does not necessarily mean that the infection is not present, simply that it probably is not present.

Absence of the meningococcus, microscopically, does not necessarily mean an absence of the infection, for culture of a microscopically clear serum may show the meningococcus.

The administration of serum is imperatively demanded immediately and in no disease may delay in administering this harmless treatment be followed by such complete disaster.

The spinal puncture of Quincke, properly performed, is harmless, or

so nearly so that the dangers may be only remembered; it requires no special skill, but does require rigid asepsis and common sense. If, on making the puncture, the fluid is found turbid, the diagnosis may be safely inferred and the serum given, if the fluid is found clear that is no contra-indication to the use of the serum, it should be given and the further microscopic and cultural tests applied, as should be done in every case, for it is necessary to be able to say that the fluid is progressively showing fewer diplococci in order to give a true prognosis of the condition of the patient.

There is a general belief among the physicians familiar with the use and results of the serum treatment that it should be given in larger doses than is ordinarily recommended by recent writers. Their reasons for this are: That the convalescence is more rapid, a cure more probable, and that the administration of larger doses does not harm the patient. Of course the general idiosynserasy of some people to horse serums is to be also remembered, but this is so rare as to be almost a negligible quantity Probably the administration of from 20 to 30 C C in children and from 30 to 60 C C in adults would be nearer an appropriate dose than that now ordinarily used.

The non-use of serum in these cases is inexcusable; while the use of it probably will not be rewarded for a long time with the same brilliant results following the use of serums in other affections so much has been shown in this epidemic that the serum is placed on a safe plane and can no longer be considered as an experiment.

In France the figures of Dopter, taken from the records of 402 cases, show a mortality of only 16.44%, the lowest ever quoted from any source while the total mortality of cases serum treated in 1576 cases was 25. and nine-tenths per cent, as given by ten observers.

Such results as these are not to be carelessly cast aside by the few men in the profession who still have no faith in the serum treatment.

"BRILL'S DISEASE" AND ITS POSSIBLE RELATION TO TYPHUS FEVER.

The attention of the medical profession of the country has recently been called most forcibly to the remarkable coincidences in connection with the experimental work done in attempting to connect Typhus Fever and the so-called Brill's Disease, which latter disease has been prevalent more or less in New York City and was first described by Dr. Nathan E. Brill in a review in 1898 as a disease "clinically resembling typhoid fever, but without the Widal reaction, etc.;" again described in April, 1910, as "An acute infectious disease of unknown origin," and in August, 1911, "Pathological and experimental data derived from a further study of an acute and infectious disease of unknown origin."

The Public Health and Marine Hospital Service of the United States, it will be remembered, has recently been doing a vast amount of experi-

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mental work in Mexico in attempting to throw some light on the specific cause and general characteristics of typhus fever, and the description by Brill about that time caused the investigators to note the close similarity between the disease as described and the type of Mexican typhus they were considering, with the result that experimental work was undertaken with the view of determining the relationship between the two troubles, if there was any such connection. The results of this work is just being sent to the profession and shows that there is more than an accidental similarity or coincidence in the two affections.

Monkeys previously infected with Brill's disease in New York City could not be inoculated with the Mexican typhus in Mexico, but those free from previous infection were inoculated with typhus, while those monkeys previously infected with typhus could not be inoculated with the infection of Brill.

The pertinency of this to us is the possibility of having a recurrence of typhus fever in the United States. The description of Brill's disease causes one to almost instinctively think of typhus fever and the symptoms of the disease are almost identical with those of typhus. It has been suggested that the mildness of Brill's may be due to the attenuation in some way of the infection or to some unknown factor and that the cases described by Brill were typhus of a mild type and the impossibility of infecting the previously infected monkeys, but its ease in the controls must surely be due to more than a mere accidental set of conditions.

The United States has been rather more than free from such troubles, probably due to better sanitary conditions, for many years; our first outbreak occurred in the New England states in 1812. In 1836 a most deadly epidemic occurred in Philadelphia and in 1893 New York City had 150 cases of the very mild type. The discovery at this time of this similarity above noted leads one to conclude that the possibility of another outbreak is to be considered.

TO COUNTY SECRETARIES.

Your attention is again called to the necessity of having your reports in the hands of the State secretary as soon as possible. Every day your remittance for your county society, giving exact names, initials and addresses, is delayed means confusion and chances of error in making up the annual report to the American Medical Association. This year the correctness of this report at this time is more important than usual as a new directory is undergoing compilation and it is the desire of everyone to have it free from error and misinformation.

The success of the county society depends largely on the business ability of the secretary and his promptness in making his annual collections, and, while you are either not paid at all or very poorly, you should make an effort to inject business methods into your office and have your reports complete and up to the minute so far as your particular society goes.

IDEAL CONDITIONS OF SERUM MANUFACTURE.

If there is one therapeutic agent which, more than another, should be prepared with scrupulous care, that agent is diphtheria antitoxin. Its preparation should never be entrusted to the inexperienced or to those who are hampered by lack of facilities. It should have its origin in the blood of healthy horses—animals whose blood is known to be pure. The welfare of the diphtheritic patient demands a serum from which every element of conjecture is eliminated. In the opinion of many physicians these essentials are best exemplified in the Antiphtheric Serum of Parke, Davis & Co. Certain it is that this antitoxin is manufactured under conditions that are ideal. Miles removed from the smoke and dust of Detroit, hundreds of feet above the river level, the company maintains a large stock farm, aquipped with model stables and supervised by expert veterinarians. Here, in the best possible condition, are kept the horses employed in serum-production. The laboratories in which the antitoxin is prepared, tested and made ready for the market are the admiration of scientific men who visit them.

BOOK REVIEWS

SAUNDERS' NEW CATALOGUE.

W. B. Saunders Company have just issued a new (16th) edition of their Illustrated Catalogue, which describes some forty new books and new editions published by them since the issuance of the former edition.

The books listed in this catalogue cover every subject of interest to the medical man. The descriptions and illustrations are such as to enable the reader to select easily just the book he wishes on any branch. It is really an index to correct medical literature—an index by which the practitioner, the surgeon, and the specialist can acquaint himself with what is new in the literature of his subject.

This edition also contains an illustration and description of Saunders' new building, now being erected on Washington Square, Philadelphia's new publishing center.

Any physician wishing a copy of this handsome catalogue can obtain one free by addressing W. B. Saunders Company, 925 Walnut street, Philadelphia.

Third Annual Report of the OKLAHOMA DEPARTMENT OF HEALTH, Division of Food and Drugs.

For the year ending October 31, 1911.

This report, issued by the State Commissioner of Health, tabulates the work done by the Division of Food and Drugs of the Department of Health of Oklahoma, and also contains digests, opinions and decisions affecting the food and drug conditions of the state. The report shows that an immense amount of work has been done in this respect and that our forces are efficient and effective in this field.

Pellagra.

Pellagra. By George M. Niles, M. D., Professor of Gastro-enterology and Therapeutics in the Atlanta School of Medicine, Atlanta, Georgia. Octavo of 253 pages, illustrated. Philadelphia and London: W. B. Sounders Company, 1912. Cloth, $3.00 net.

The publishers declare that this is the first book on Pellagra written by an American author, and believe that it will fill a much-needed space in American Medical Literature. The work is very well illustrated with the different types of this baffling disease and the Bibliography is very complete.

The history of Pellagra is considered from the earliest time it has been noted, and copious extracts from the writings of other authors is made on the diagnosis, prognosis, symptoms and treatment of the disease.

The author states that European scientists have been concerned with this affection for nearly two centuries and that the proper treatment of it will require much clinical observation, laboratory and special technic, and that the different phases of the disease will require uses of special drugs, baths, waters and electricity and patience and time. With these ends his work is concerned, and the reader who is interested in the sujbect must conclude that he has handled his subject well.

INTERNATIONAL CLINICS

Volume I. TWENTY-SECOND SERIES. 1912.

A Quarterly of Illustrated Lectures and especially prepared Original Articles on General Surgical, Medical and Special Topics of interest to the Surgeon, Physician and Specialist.

Edited by Henry W. Cattell, A. M., M. D., Philadelphia, U. S. A., with the collaboration of many American and European authors. Cloth, Price $2.00 net. J. B. LIPPINCOTT COMPANY, Philadelphia and London.

IODIN IN SMALL-POX.

C. S. Rockhill, Cincinnati (Journal A. M. A., January 27), reports that he has used a 10 per cent. iodin and 90 per cent. glycerin mixture painted over the postules of small-pox during the past year with very satisfactory results. It dries the pustule, causes absorption of the toxin and arrests the destruction of tissue, thus preventing the usual disfigurement. It has shortened the duration of the hospital stay, from twenty-five or thirty days under the old treatment, to eight to fifteen days. The pustules on the face may be opened with a sterile instrument and touched up with tincture of iodon. Eighty-five patients have been treated by this method within the past year, with 100 per cent. of recoveries and an average stay in the hospital of twelve days.

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